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**PROVISIONAL PATENT APPLICATION**

**TITLE:**

**Carriage and Support System**

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## **CARRIAGE AND SUPPORT SYSTEM**

This application claims priority to U.S. Provisional Application No. 60/395,893 filed July 15, 2002.

The invention is a system for carrying or supporting one or more objects. The system comprises a serpentine article, a fastening mechanism and a loop for easy carriage or hanging of the one or more objects.

This invention is directed to a carrying or supporting system. More specifically, this application relates to a fastening mechanism and loop system which can be used to support or carry one or more objects.

There are situations in which there is a need to quickly establish and maintain carriage of an object. In those circumstances a system directed to easy carriage and support is required.

In the context of the present system, buckles should function under a wide variety of end-use situations in which they will be exposed to extremes of environmental conditions; for example dry, sub-zero, arctic-like conditions, or wet, tropical, marine conditions. The buckles may also be subject to mechanical abuse and, because they perform very basic functions, their maintenance is easily overlooked. Thus, in preferred embodiments, the invention provides buckles of particularly robust design.

Such a system has application in diverse situations. For example, in the marine market they are useful for handling and securing dock lines, tow lines, and on straps for flotation devices. On sailboats they are useful as components of rigging, including on down hauls and preventers and for securing sails, furled or unfurled, to the boom, the deck, or to themselves.

In markets for sporting or recreational goods, a carriage and support system can find use in combination with tents, backpacks (including straps to secure items to the backpack), fanny packs, sleeping bags, and climbing harnesses and with ropes for climbing lines.

In medical markets, a carriage system can be used as a component in traction devices (for treating muscular-skeletal injuries), in abdominal and thoracic binders, in

sphygmomanometer cuffs, in retaining or securing orthopedic devices (including splints and casts), and as components of a tourniquet assembly.

Carriage and support systems can also be used in goods for the home. For example, buckles are useful for holding Christmas trees in Christmas tree stands as described in U.S. patent No. 05,842,676 which is incorporated herein by reference in its entirety.

There is a plethora of uses to which strap systems can be put. The present invention is a system that can be used widely amongst those uses.

#### Brief Description of the Drawings

Figure 1 shows a cross section of a preferred strap system.

Figure 2 also shows the strap system.

#### Description of the Invention

There is in the art a need for a simple system for carriage of objects. The present invention comprises a system for such carriage. The system of the present invention comprises a serpentine article such as a strap or rope, a fastening mechanism such as a buckle and a loop for easy carriage or support of the article when used in conjunction with the serpentine article and fastening mechanism.

Provided is a carrier system comprising: a releasable adjustable fastening mechanism; and, a serpentine article engaged in the releasable adjustable fastening mechanism; wherein the serpentine article is fixedly attached to form a loop of strap, the strap extending in two directions from the loop. In one embodiment, the buckle comprises (a) at a first end an attachment point to which a first end of the serpentine article is fixedly attached, (b) towards a second end (i) an entry point into which a second end of the serpentine article is threaded for releasable adjustable engagement with the buckle and (ii) an engagement surface and a cam that at one end engages the strap and presses it against the engagement surface to lock

the engagement when pressure is applied to push the strap away from the second end of the buckle, said buckle free of any spring for biasing the cam.

Referring to the drawings, a carriage and support system is illustrated. In its basic components the strap system incorporates a serpentine article (750), a fastening mechanism (700), and a loop (800).

In preferred embodiments of the present invention the serpentine article is a flexible strap. In preferred embodiments of the invention the serpentine article of the present invention has a pair of ends each of which is preferably fixedly attached with a fastening mechanism.

In one preferred embodiment of the present invention the fastening mechanism used in the carrier system is a buckle as that described in U.S. Patent No. 6,295,700 ('700 patent) which is incorporated herein by reference. The buckle of that patent comprises a main structure comprising a coupling portion and an interior chamber. The surface of the interior chamber defines a curvilinear guide surface, which curvilinear guide surface comprises at least one first load bearing portion, which first load bearing portion is located within the interior chamber. The curvilinear surface is adapted to guide the serpentine article from an insertion point adapted to receive the serpentine article from a tension-bearing direction, between the cam and the first load bearing portions, through the interior chamber, and out at an exit point leading to a release direction. The buckle of U.S. Patent No. 6,295,700 also incorporates a cam which is rotatably coupled to the main structure and comprises at least a second load bearing portion. The cam rotates about an axis of rotation between closed and open positions such that, when the cam is in the closed position, at least one second load bearing portion of the cam is so juxtaposed to a corresponding first load bearing portion that a serpentine article passing between the cam and the first load bearing portions is pinched between the first load bearing portions and the corresponding second load bearing portions. In this described buckle a tensile force on the serpentine article in the tension-bearing direction acts to further rotate the cam to increase the pinching force on the serpentine article. Whereas a tensile force on the serpentine article in the release direction acts to further counterrotate the cam to release the pinching force on the serpentine article a tensile force in the tension-bearing

direction is adapted to apply a force vector substantially orthogonal to a said first load bearing portion located proximal to the insertion point.

In the exemplary fastener of Figure 1, Cam 720 is attached to arm 763. A threading device is formed of threading plate 770A and curved threading plate 770B. The threading device is preferably formed in two pieces to facilitate molding of the buckle. The cam 720 has first cam load bearing portion 721 and second cam load bearing portion 722. The threading plates provide a self-threading function. Serpentine article 750 is threaded from "below," meaning into entry slot 781 and through slot 782. The serpentine article 750 is then threaded down channel 761. When the end of serpentine article 750 meets the space between first cam load bearing portion 721 and first buckle structure load bearing portion 741, it either passes between the two if the cam is in the open position, or pushes the two load bearing portions apart, to move the cam into open position. The end of serpentine article 750 then meets the threading plate, which is shaped to direct the serpentine article through the buckle and upwards to exit slot 783. In this way, threading the serpentine article is conducted from an accessible entry slot and an accessible channel, and the further internal threading operations are self-threading. Post 785 secures one end of the serpentine article. Again with respect to the exemplary fastener of Figure 1, loop 780 is formed, for example, by overlap 786 and folded overlap 787, which are secured by stitches 788 (shown schematically).

When used in the carrier system, the fastener of the '700 patent binds the serpentine article 750 more tightly when additional pressure is applied to the serpentine article, such as by engaging the loop 800. Other fasteners that self-lock are known in the art and preferred for use in the carrier system. The loop can be placed near the point on the fastener to which the serpentine article is fixedly attached.

Figure 2 shows another carrier system with fastener 600, serpentine article 650 and loop 680.

In preferred embodiments of the present invention the loop described is incorporated into the serpentine article using stitching, tacking or sewing. In more preferred embodiments the serpentine article extends in two directions from the loop. In especially preferred embodiments of the present invention the loop described comprises a section of the

serpentine article folded and stitched, tacked, sewed or otherwise fixedly attached to itself such that an "S" shape is formed, the loop being comprised of one of the two opposing "C" shaped sections of the "S" fold.

In one embodiment of the present invention the loop of the system is adapted to fit a hand. In a further embodiment of the present invention the loop is adapted to be hung over a strut or nail or other support.

In one embodiment of the present invention the circumference of the loop is between approximately 4 inches and approximately 12 inches. In a preferred embodiment of the present invention the circumference of the loop is between approximately 7 inches and approximately 10 inches.

In one embodiment of the present invention the loop is positioned within approximately 6 inches of one end of the serpentine article. In another preferred embodiment of the present invention the loop is positioned within approximately 3 inches of one end of the serpentine article.